

What is claimed is:

1. An aqueous coating composition comprising poly-carbonate polyols **A2** and a polyurethane chain-extended with compounds **D** which are at least difunctional with respect to isocyanates, said polyurethane comprising building blocks of hydroxy acids **C** and urethane groups derived from polyfunctional isocyanates **B** and said polyurethane containing blocks derived from polyene polyols **A1** and from polycarbonate polyols **A2**.
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2. The aqueous coating composition as claimed in claim 1, wherein the mass ratio of blocks derived from polyene polyols **A1** to blocks derived from polycarbonate polyols **A2** is from 1:8 to 4:5.
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3. The aqueous coating composition as claimed in claim 1, whose acid number is at least 15 mg/g.
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4. The aqueous coating composition as claimed in claim 1, wherein the isocyanates **B** are aliphatic linear, branched or cyclic isocyanates.
- 25 5. The aqueous coating composition as claimed in claim 1, wherein the ratio of the amount of substance of the isocyanate-reactive groups of the chain extenders **D** to the amount of substance of the isocyanate groups in the isocyanate-functional prepolymers is from 0.5:1 to 1:1.
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6. A process for preparing an aqueous coating composition as claimed in claim 1, which comprises in the first step a) preparing an isocyanate-

functional prepolymer from the polyene polyols **A1**,
the hydroxy acids **C**, and the polyfunctional
isocyanates **B** and in the second step b) mixing said
prepolymer with the polycarbonate polyol **A2** and,
5 after an at least partial reaction, in the third
step c) dispersing this mixture with water
containing a chain extender **D**.

7. The process as claimed in claim 6, wherein, in the
10 reaction in step c), from 1 to 20 % of the
polycarbonate polyol **A2** reacts with the isocyanate-
functional prepolymer to form an adduct.
8. The process as claimed in claim 6, wherein the
15 isocyanate-functional prepolymer prepared in step a)
has a Staudinger index of at least 18 cm³/g.
9. A method of use of an aqueous coating composition as
claimed in claim 1 to produce soft coatings,
20 comprising coating substrates selected from metal,
plastic, wood, stone, and concrete with the coating
composition as claimed in claim 1 and an isocyanato-
containing crosslinking agent.
- 25 10. A substrate coated with an aqueous coating
composition as claimed in claim 1.